



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,498	05/10/2005	Andrew C. Lewin	124-1117	4702

23117 7590 12/21/2007
NIXON & VANDERHYE, PC
901 NORTH GLÈBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

BRAINARD, TIMOTHY A

ART UNIT	PAPER NUMBER
----------	--------------

3662

MAIL DATE	DELIVERY MODE
-----------	---------------

12/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,498

Applicant(s)

LEWIN ET AL.

Examiner

Timothy A. Brainard

Art Unit

3662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-32 and 34-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-32 and 34-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 5, 16, 34-38, 41-43, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi et al (US 4867570) in view of Magarill (US 5625738). Sorimachi teaches (claim 1) a ranging apparatus comprising an illumination means for illuminating a scene with a projected two dimensional array of light spots, a detector for detecting the location of spots in the scene and a processor adapted to determine, from the detected location of a spot in the scene, the range to that spot (col 1, lines 23-31 and fig 1), (claim 2) the illumination means and detector are arranged such that each spot in the projected array appears to move in the detected scene, from one range to another, along an axis and the axis of apparent motion of each adjacent spot in the projected array is different (fig 1), (claim 5) the processor is adapted to resolve any possible ambiguity in range to each spot (col 2), (claim 16) the detector comprises a two dimensional CCD or CMOS array (col 5 lines 5-10). Sorimachi does not teach the illumination means comprises a light source arranged to illuminate part of the input face of a light guide, the light guide comprising a tube having substantially reflective sides and being arranged together with projection optics so as to project an array of distinct images of the light source towards the scene, the light guide comprises

a tube having a square cross section, or the light guide comprising a tubing having a reflective tubing. Magarill teaches (claim 1) the illumination means comprises a light source arranged to illuminate part of the input face of a light guide, the light guide comprising a tube having substantially reflective sides and being arranged together with projection optics so as to project an array of distinct images of the light source towards the scene (fig 1 and col 6 lines 25-52), (claim 34) the light guide comprises a tube having a square cross section (fig 1a), (claim 35) the light guide comprises a tube having reflective internal surfaces (abs). It would have been obvious to modify Sorimachi to include the illumination means comprises a light source arranged to illuminate part of the input face of a light guide, the light guide comprising a tube having substantially reflective sides and being arranged together with projection optics so as to project an array of distinct images of the light source towards the scene, the light guide comprises a tube having a square cross section, and the light guide comprising a tube having reflective internal surfaces because it is one of multiple apparatuses used to transmit light onto a scene with no new or unexpected result. Sorimachi teaches (claim 37) the projection optics comprises a projection lens (fig 1 item 2), (claim 38) the light source is arranged to illuminate the input face of the light guide through a mask (fig 1, item 3), (claim 41) the illumination means comprises more than one light source, each light source arranged to illuminate part of the input face of the light guide (fig 1, item 3), (claim 42) the light sources are arranged in a regular pattern (fig 2, item 3), (claim 43) the light sources are arranged to provide differing spot densities (fig 1 and 2), (claim 46) the light source has a shape which is not symmetric about a reflection axis of the light

guide (fig 2). With respect to claim 36, it is expected that the light guide comprises a tube of solid material adapted such that a substantial amount of light incident at an interface between the material of the tube and surrounding material undergoes total internal reflection.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Hosterman (US 3589815). Hosterman teaches the illumination means adapted to project an array of spots which is focused at a first distance and unfocussed at a second distance, the first and second distance within the operating range of the apparatus (abs). It would have been obvious to modify Sorimachi in view of Magarill to include the illumination means adapted to project an array of spots which is focused at a first distance and unfocussed at a second distance, the first and second distance within the operating range of the apparatus because it help determine distance faster with multiple focus distances. Sorimachi teaches the illumination means adapted to project an array of spots which are non-circular in shape when focused.

Claims 7-12 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Kuroda (US 2003/0128361). Kuroda teaches (claim 7 and 8) the illumination means is adapted to cyclically alter the two dimensional array of projected spots, and (claim 9) the processor is adapted to determine any areas of ambiguity in the detected array and deactivate one or more of the projected spots so as to resolve the ambiguity, (claim 10-12) the illumination means is adapted to so as to produce an array of spots wherein at

least some projected spots have a different color or shape to adjacent spots, (claim 48) periodically redirecting the array of spots on the scene (para 8 and fig 4B). It would have been obvious to modify Sorimachi in view of Magarill to include the illumination means is adapted to cyclically alter the two dimensional array of projected spots, and the processor is adapted to determine any areas of ambiguity in the detected array and deactivate one or more of the projected spots so as to resolve the ambiguity or the illumination means is adapted to so as to produce an array of spots wherein at least some projected spots have a different color or shape to adjacent spots and periodically redirecting the array of spots on the scene because each is just one of multiple ways to manipulate the transmitted light that will give information about the distance to the projected spot on the object with no new or unexpected result.

Claim 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Holec (US 6392744). Holec teaches the spots comprise intersections between continuous lines (col 1, lines 29-52). It would have been obvious to modify Sorimachi in view of Magarill to include the spots comprise intersections between continuous lines because it is one of multiple light patterns that will be reflected and received by a receiver to determine distance with no new or unexpected results.

Claim 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill in view of Holec as applied to claim 13 above, and further in view of Takehana (US 4740806). Takehana teaches the illumination means projects two sets of regularly spaced lines, the two sets of lines being substantially orthogonal. It

Art Unit: 3662

would have been obvious to modify Sorimachi in view of Magarill in view of Holec to include the illumination means projects two sets of regularly spaced lines, the two sets of lines being substantially orthogonal because it is one of multiple light patterns that will be reflected and received by a receiver to determine distance with no new or unexpected results. Sorimachi teaches the processor is adapted to determine the range to the spots then by using the determined range information determine the range between the points (col 2).

Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Uomori (US 6618123). Sorimachi teaches (claim 17) the illumination means is adapted such that the two dimensional array of spots (col 4, lines 7-50), (claim 18) the detector is adapted to capture a visible image of the scene as well as the location of the infrared spots in the scene (col 5, lines 5-30). Uomori teaches the spots being infrared spots (col 5, lines 65 – col 6, lines 9). It would have been obvious to modify Sorimachi in view of Magarill to include the spots being infrared spot because it is one of multiple design choices with no new or unexpected results.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Linn et al (US 2004/0149841). Linn teaches the baseline between the illumination means and the detector is between 50 and 100 mm. It would have been obvious to modify Sorimachi in view of Magarill to include teaches the baseline between the illumination

means and the detector is between 50 and 100 mm because it is one of multiple design choices with no new or unexpected results.

Claims 20, 22-24, and 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Taka (US 6700651). Taka teaches (claims 20, 22, and 23) the detection system adapted to image the scene from two different directions (col 2, lines 21-39). It would have been obvious to modify Sorimachi in view of Magarill to include the detection system adapted to image the scene from more than two different directions because it makes the distance measurement more accurate. Sorimachi teaches the processor applies image processing algorithms to the scenes from each viewpoint to determine the range (col 2).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill in view of Uomori as applied to claim 18 above, and further in view of Andersson (US 6545749). Andersson teaches the apparatus including scanning optical in the optical path adapted to periodically redirect the viewing direction of the detector (col 5, lines 33-42). It would have been obvious to modify Sorimachi in view of Magarill in view of Uomori to include the apparatus including scanning optical in the optical path adapted to periodically redirect the viewing direction of the detector because it would allow the operator to scan an area.

Claims 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill in view of Taka as applied to claim 20 above, and further in view of Nonaka et al (US 6801639). Nonaka teaches the detector means adapted to

have a different baseline to the illumination means in each viewpoint (fig 5a). It would have been obvious to modify Sorimachi in view of Magarill in view of Taka to include the detector means adapted to have a different baseline to the illumination means in each viewpoint because it is one of multiple placements of the detectors with no new or unexpected results.

Claims 27 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill in view of Taka as applied to claim 20 above, and further in view of Maimon (US 6480265). Maimon teaches the baseline of the two viewpoints lie along different axes (fig 9). It would have been obvious to modify Sorimachi in view of Magarill in view of Taka to include the baseline of the two viewpoints lie along different axes because it is one of multiple placements of the detectors with no new or unexpected results. Sorimachi teaches the light source illuminates with a non-circular shape (fig 2).

Claims 28, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Ono (US 6538751). Ono teaches a plurality of illumination means arranged to illuminate the scene from different directions and having a different baseline to each detector (fig 1). It would have been obvious to modify Sorimachi in view of Magarill to include a plurality of illumination means arranged to illuminate the scene from different directions and having a different baseline to each detector because it is one of multiple placements of the transmitters with no new or unexpected results.

Claim 29, 32, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill in view of Ono as applied to claim 28 above, and further in view of Kuroda (US 2003/0128361). Kuroda teaches the illumination means is adapted to periodically alter the two dimensional array of projected spots and the illuminating means project spots having different characteristics (para 8 and fig 4b). It would have been obvious to modify Sorimachi in view of Magarill in view of Ono to include the illumination means is adapted to periodically alter the two dimensional array of projected spots and the illuminating means project spots having different characteristics because each is just one of multiple ways to manipulate the transmitted light that will be reflected and detected giving information about the distance to the projected spot on the object with no new or unexpected result. Sorimachi teaches the light source illuminates the input face of the light guide with a shape which is non symmetric about the axis of reflection of the light guide (fig 2

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 41 above, and further in view of Marchi (US 6512575). Marchi teaches at least one light source emits light at a different wavelength to another light source. It would have been obvious to modify Sorimachi in view of Magarill to include at least one light source emits light at a different wavelength to another light source because it is one of multiple design choices with no new or unexpected results.

Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 41 above, and further in view of

Ariyama et al (US 2003/0012115). Ariyama teaches at light one light source is shaped differently to another light source. It would have been obvious to modify Sorimachi in view of Magarill to include at light one light source is shaped differently to another light source because it is one of multiple design choices with no new or unexpected results.

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill in view of Magarill as applied to claim 41 above, and further in view of Katz (US 5012453). Katz teaches at least one light source is located within the light guide at a different depth to another light source. It would have been obvious to modify Sorimachi in view of Magarill to include at least one light source is located within the light guide at a different depth to another light source because it is one of multiple design choices with no new or unexpected results.

Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Rudd et al (US 5519204). Rudd teaches a ranging apparatus further comprising a location sensor (col 4, lines 14-25). It would have been obvious to modify Sorimachi in view of Magarill to include a ranging apparatus further comprising a location sensor because it is one of multiple design choices with no new or unexpected results.

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Farmer (US 5748295). Farmer teaches a proximity sensor incorporated in a ranging apparatus (col 9, lines 24-35). It would have been obvious to modify Sorimachi in view of Magarill

Art Unit: 3662

to include a proximity sensor incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Rajchel et al (US 6719654). Rajchel teaches target identification incorporated in a ranging apparatus (col 1, lines 43-49). It would have been obvious to modify Sorimachi in view of Magarill to include a target identification incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Frucht (US 5910767). Frucht teaches intruder detection incorporated in a ranging apparatus (col 1, lines 35-43). It would have been obvious to modify Sorimachi in view of Magarill to include an intruder detection incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Ittycheriah et al (US 6580814). Ittycheriah teaches a biometric modeling apparatus incorporated in a ranging apparatus (abs). It would have been obvious to modify Sorimachi in view of Magarill to include a biometric modeling apparatus incorporated in a ranging apparatus because it is one of multiple design choices with no new or unexpected results.

Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sorimachi in view of Magarill as applied to claim 1 above, and further in view of Nakashima (US 6721465). Nakashima teaches a document scanner comprising an imager and a ranging apparatus, wherein the imager is adapted to process the range information from the document to determine the extent of curvature thereof and process the detected image to correct for any curvature (col 7, lines 47-62). It would have been obvious to modify Sorimachi in view of Magarill to include a document scanner comprising an imager and a ranging apparatus, wherein the imager is adapted to process the range information from the document to determine the extent of curvature thereof and process the detected image to correct for any curvature because it is one of multiple design choices with no new or unexpected results.

Response to Arguments

Applicant's arguments filed 10/9/2007 have been fully considered but they are not persuasive. Applicant argues that:

1) There is simply no disclosure of the features of Applicants' claim 1 in either the Sorimachi or Magarill references. Since neither reference teaches this claimed feature of independent claim 1, even if combined, the Sorimachi/Magarill references cannot render obvious the subject matter of claim .

Response: Figure 3 of Magarill shows two beams entering a square rectangular guide.

2) There is no motivation to combine Sorimachi and Magarill

Response: Magarill merely teaches that light can ricochet off the hollow rectangular tube and transmitted out to illuminate a target. One skilled in the art would have combined these references merely as choice of how to transmit light spots to the object.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy A. Brainard whose telephone number is (571) 272-2132. The examiner can normally be reached on Monday - Friday 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (571)272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TAB


THOMAS H. TARCZA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600